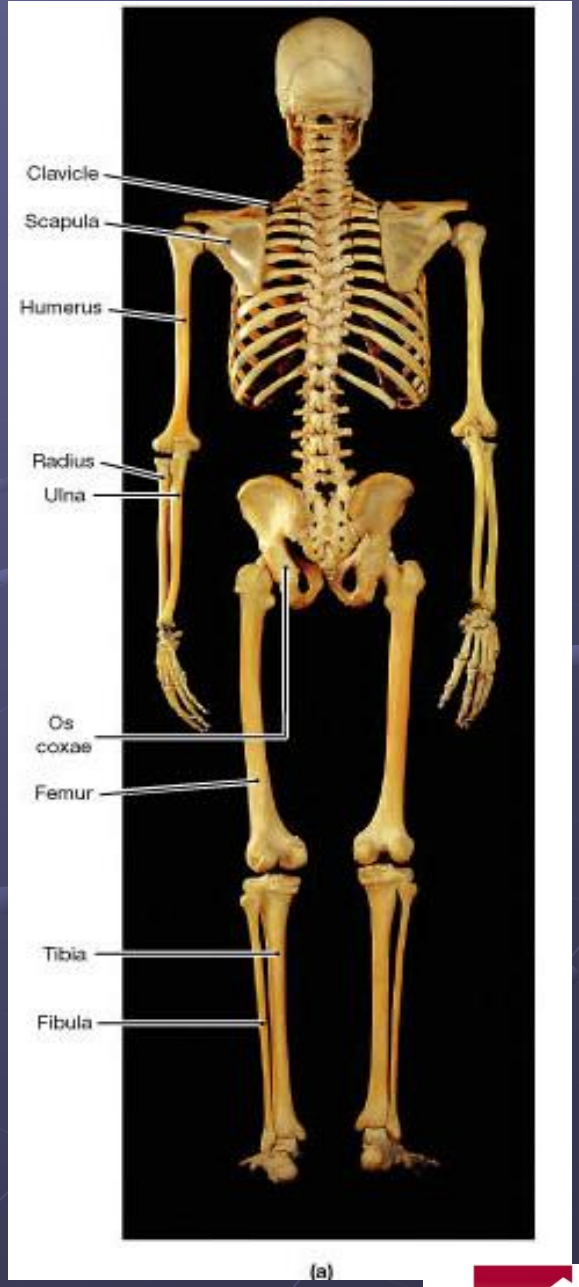
Chapter 8, Bones, Part 2: The Appendicular Skeleton

Appendicular Skeleton =

Everything that is not the Axial Skeleton, i.e., pelvis and limbs



Goal: Learn and locate the bones and markings of the appendicular skeleton

Developed by
John Gallagher, MS, DVM

LAS POSITAS COLLEGE

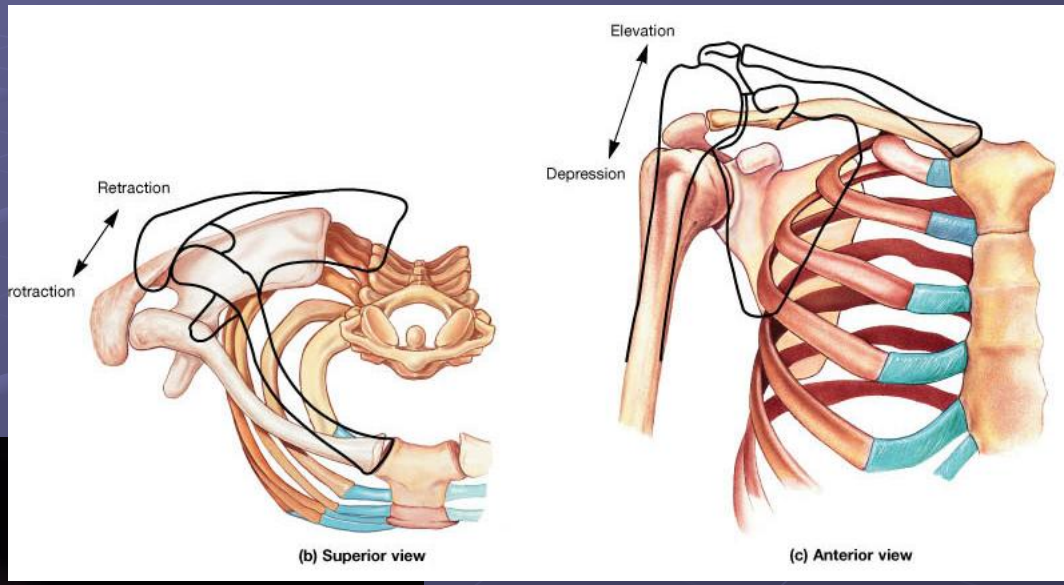
The Girdles

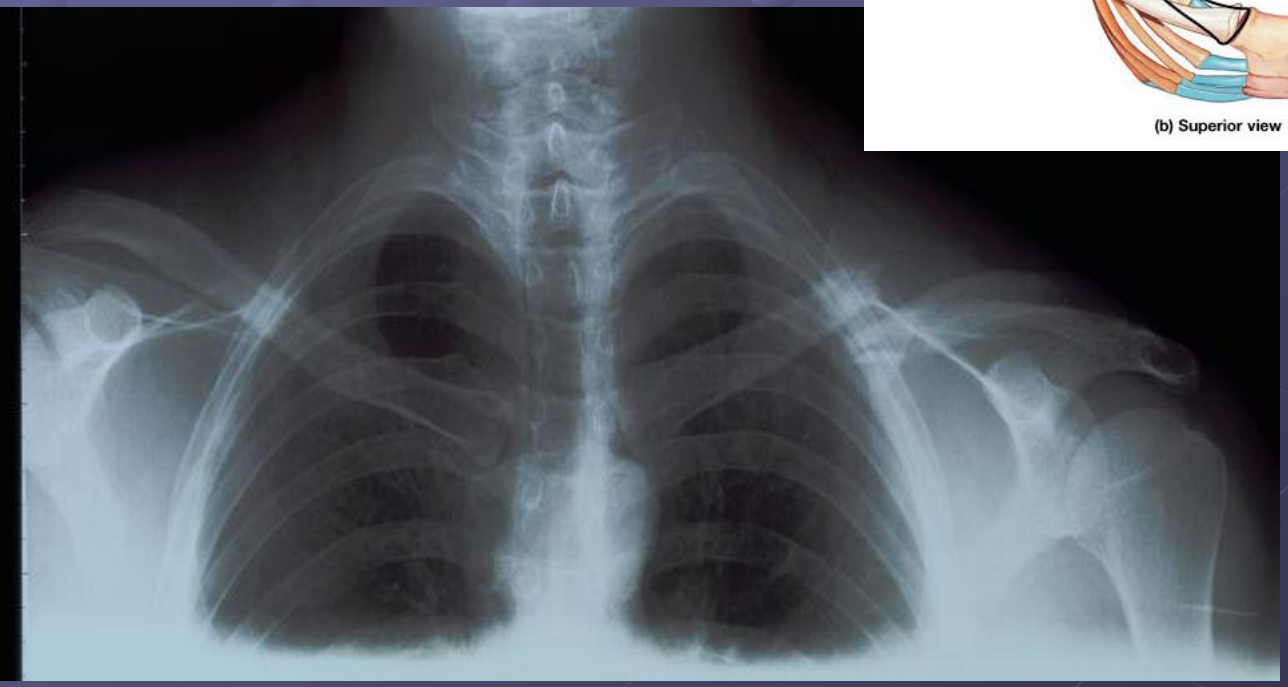
- Pectoral Girdle
  - Supports the Arms
  - Clavicle and Scapula
- Pelvic Girdle
  - Supports the Legs
  - Pelvis
    - Ilium, ischium, pubic bone

Clavicle (collarbone)

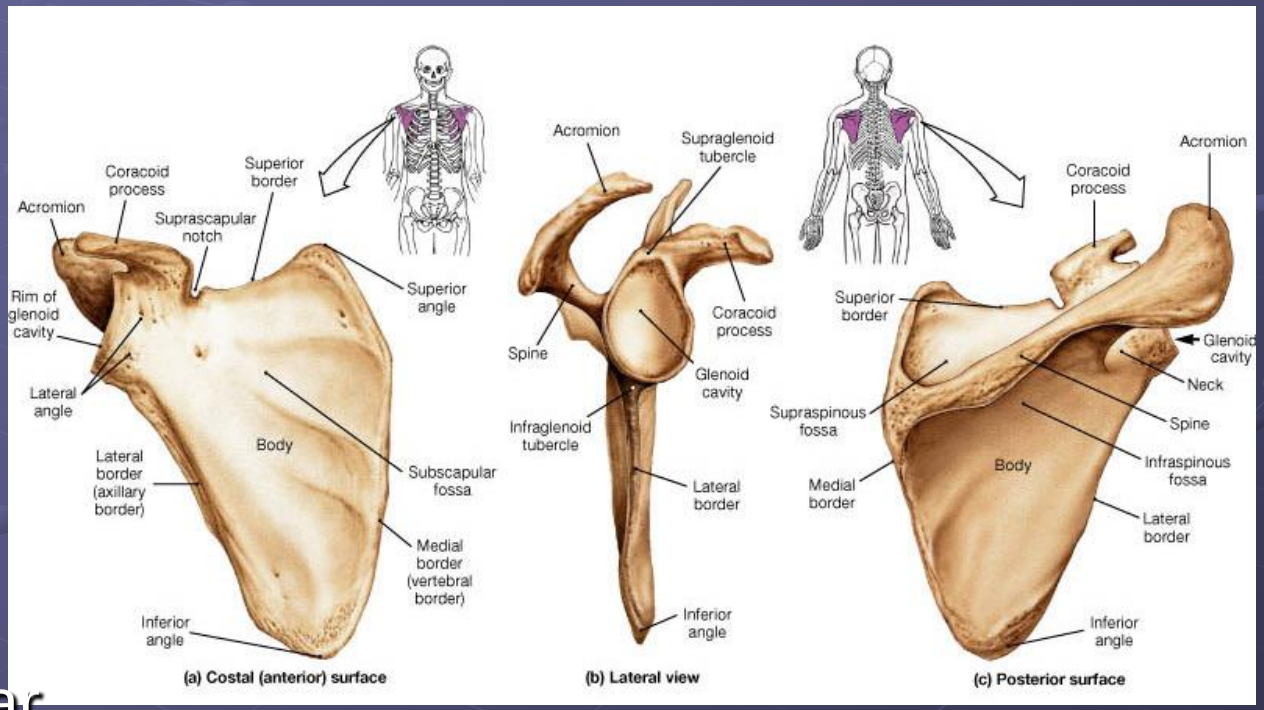
Manubrium to Acromion

Frequently fractured





Scapula (shoulder blade)

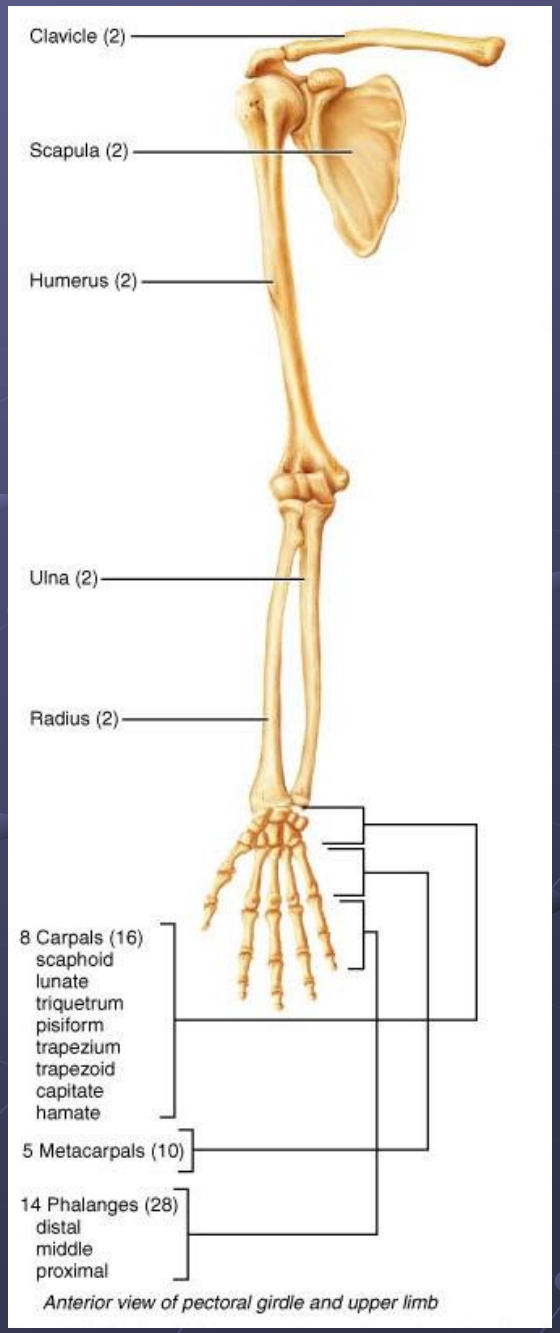


- Glenoid
- Spine
- Acromion
- Acromioclavicular joint
- Inferior and Superior Angles

- Origin of biceps brachii muscle:
  - Coracoid Process
  - Supraglenoid tubercle

The Arm

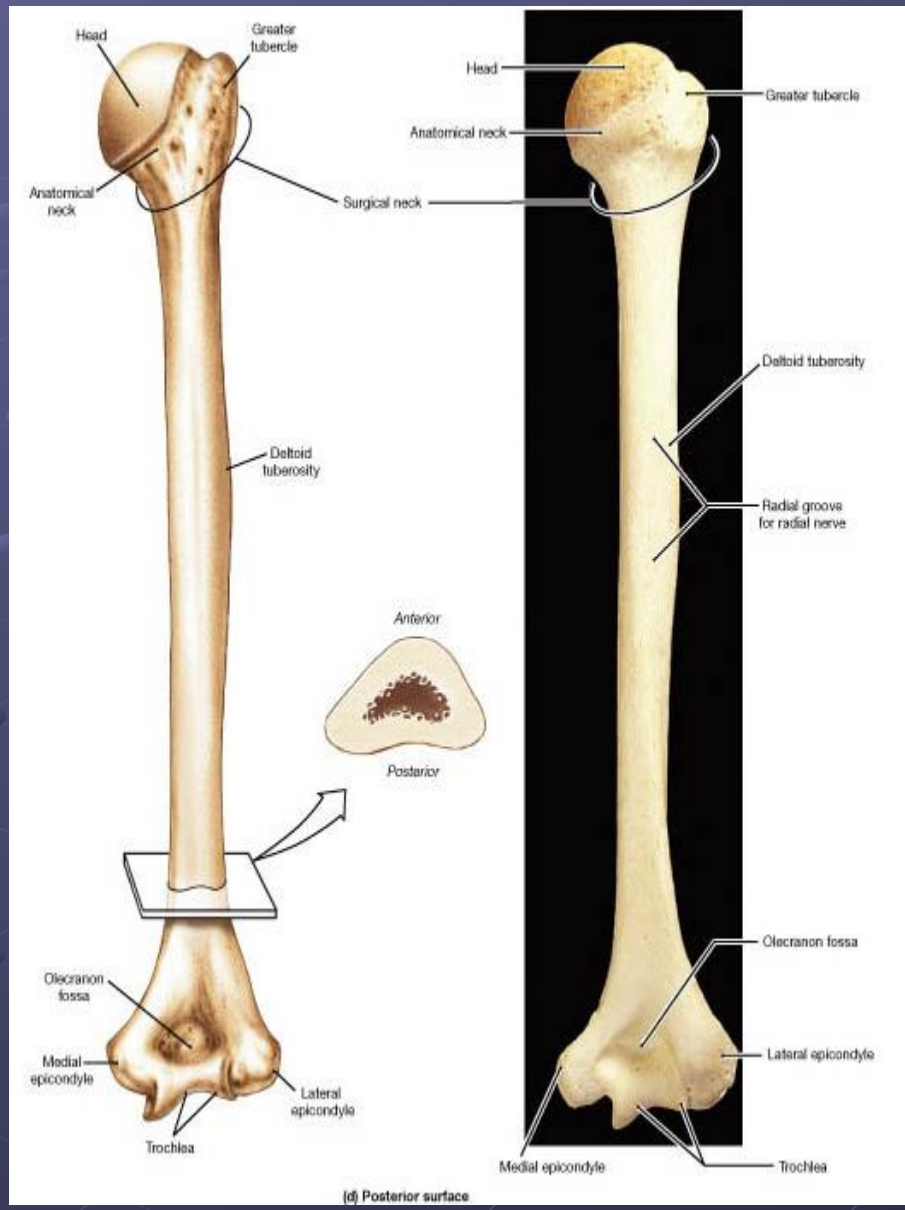
- Synonym: Upper limb
  - Upper Arm = Brachium
  - Forearm = Antebrachium
- Humerus, Radius and Ulna
- Carpus (wrist)
- Hand (manus)



Anterior view of pectoral girdle and upper limb

Humerus

- Head
- Greater and Lesser Tubercles
- Intertubercular Sulcus
  - Biceps tendon
- Coronoid Fossa
- Olecranon Fossa
- Trochlea
- Medial and Lateral Epicondyles



Radius

- Head, neck, shaft
- Insertion of biceps brachii:
  - Radial Tuberosity
- Radial Styloid Process

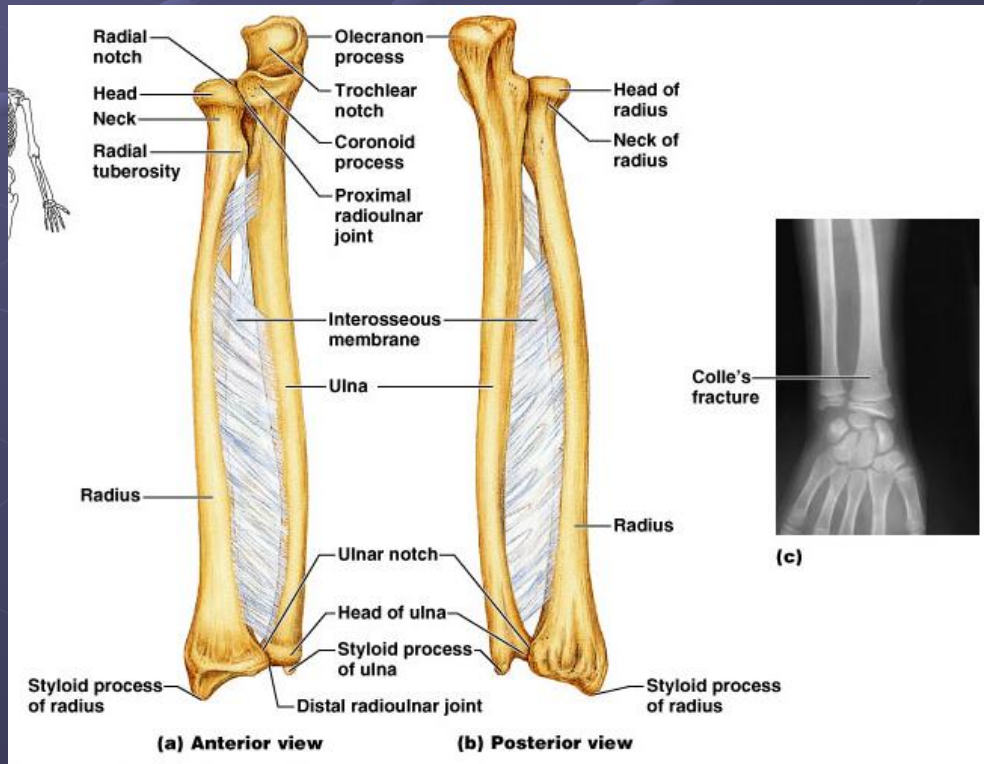
Ulna

- Olecranon
- Trochlear notch
- Coronoid Process
- Ulnar Styloid Process

Interosseous Membrane (between radius and ulna)

Note how the two bones can cross

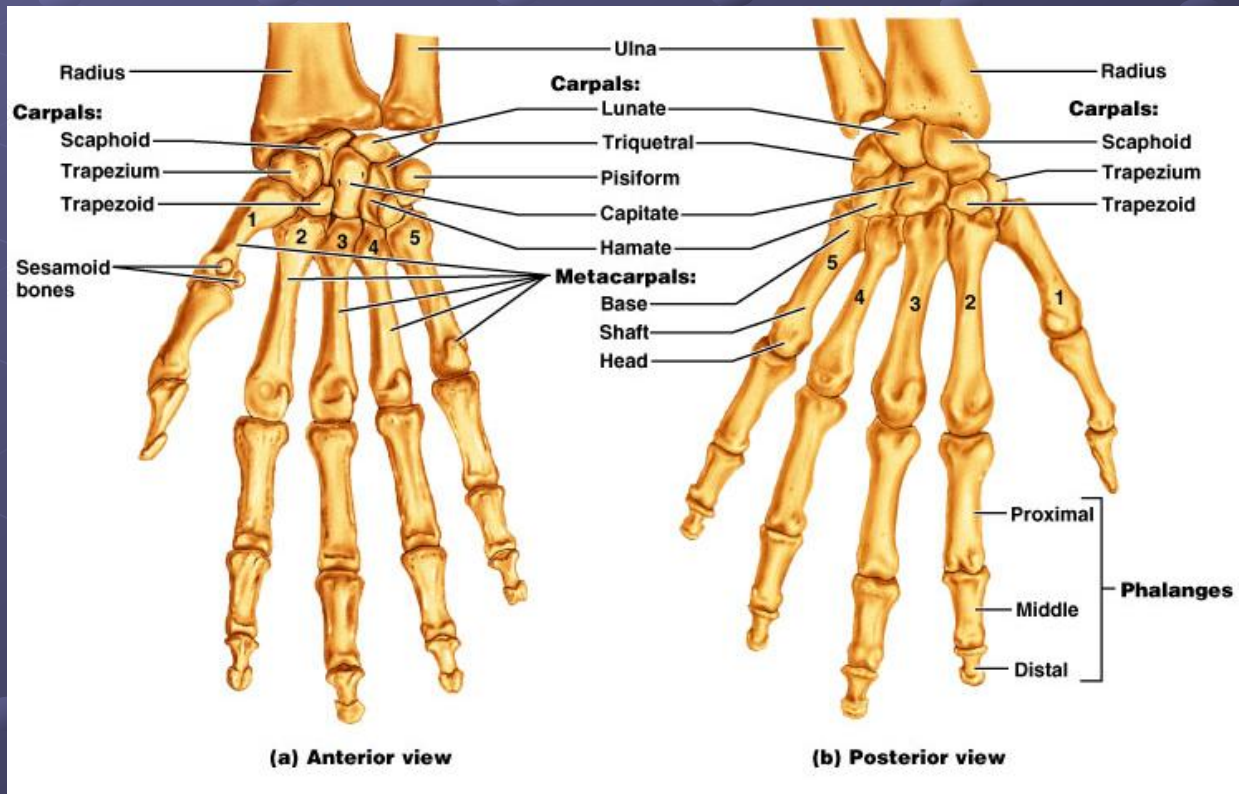
“Funny bone”



Carpus = Wrist

- Four Proximal
  - Scaphoid, lunate, triquetrum, pisiform
- Four Distal
  - Trapezium, trapezoid, capitate, hamate

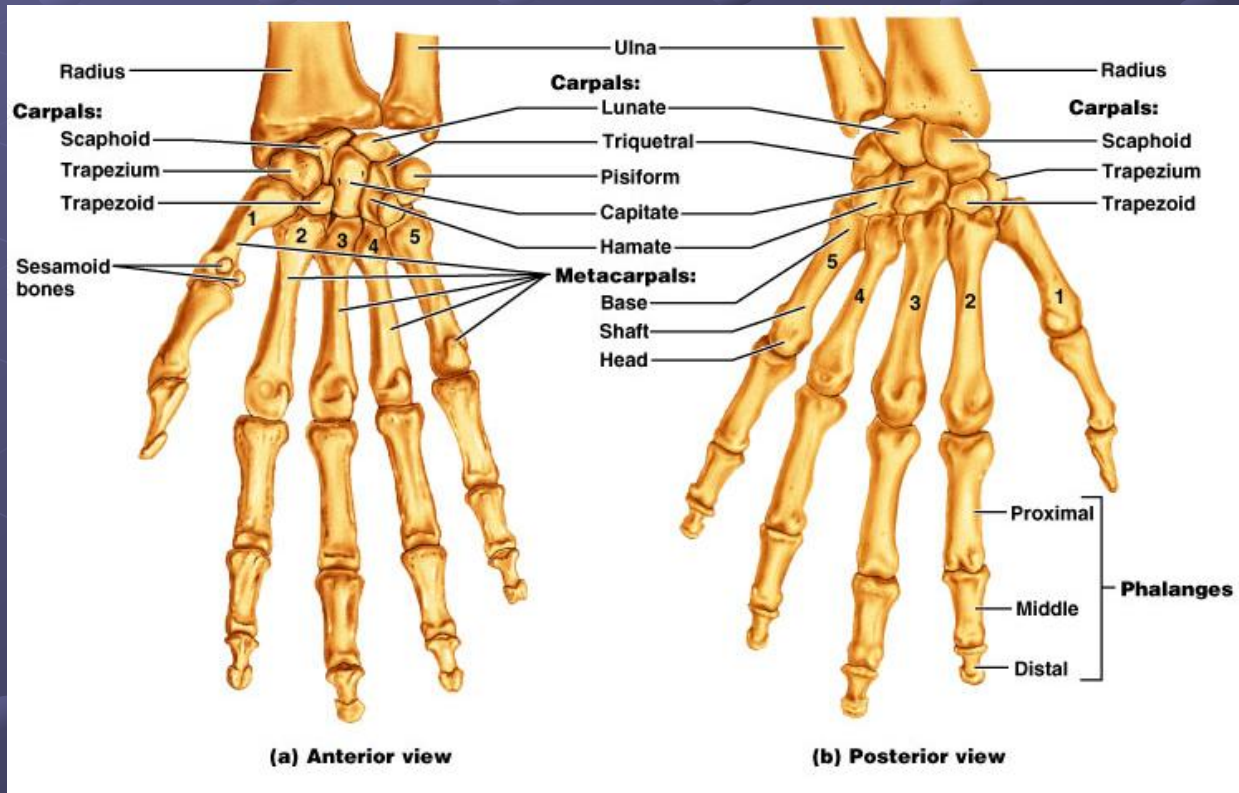
Scaphoid is frequently fractured



Hand = Manus

Five metacarpal bones (1-5)

Five fingers
- Labeled 1-5
- Thumb = Pollex = digit 1
  - Two phalangeal bones
- Fingers = phalanges = digits 2-5
  - Three phalangeal bones
    - Proximal, middle, distal

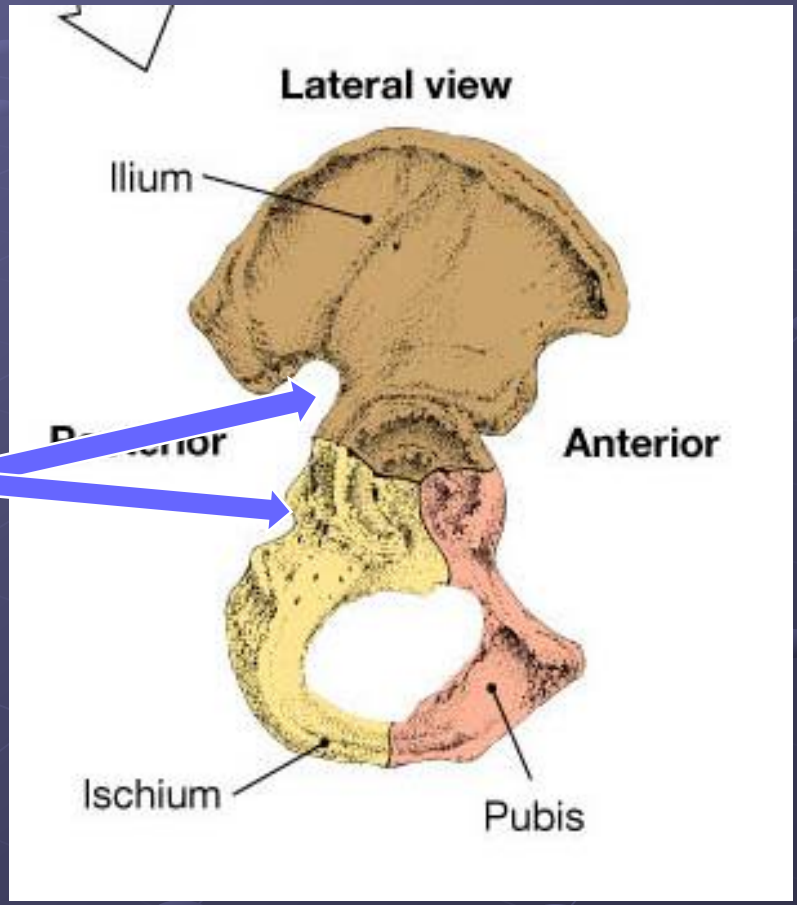


The Girdles

- Pectoral Girdle
  - Supports the Arms
  - Clavicle and Scapula
- Pelvic Girdle
  - Supports the Legs
  - Pelvis (os coxae)

Pelvis = os coxae = hip bone = (innominate bone)

- Three bones: Ilium, Ischium, Pubis
- Anterior and posterior iliac spines meet to form the iliac crest
- Greater and Lesser Sciatic Notches
- Ischial Tuberosity
- Acetabulum
  - Acetabular fossa
- Obturator Foramen



More Pelvis

- Articular Surface for Articulation with Sacrum
- Difference between male and female
- Pelvic (or pubic) symphysis
  - Fibrocartilage
  - Stretches at childbirth (Relaxin)

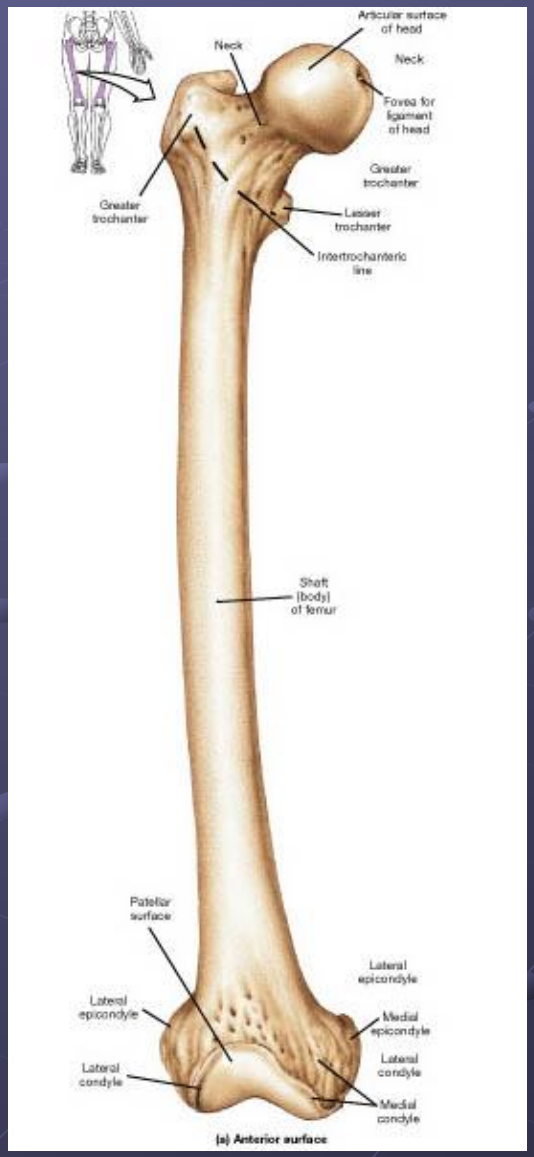
The leg

- AKA Lower Limb

- Femur
- Patella
- Tibia/fibula
- Tarsus
- Foot

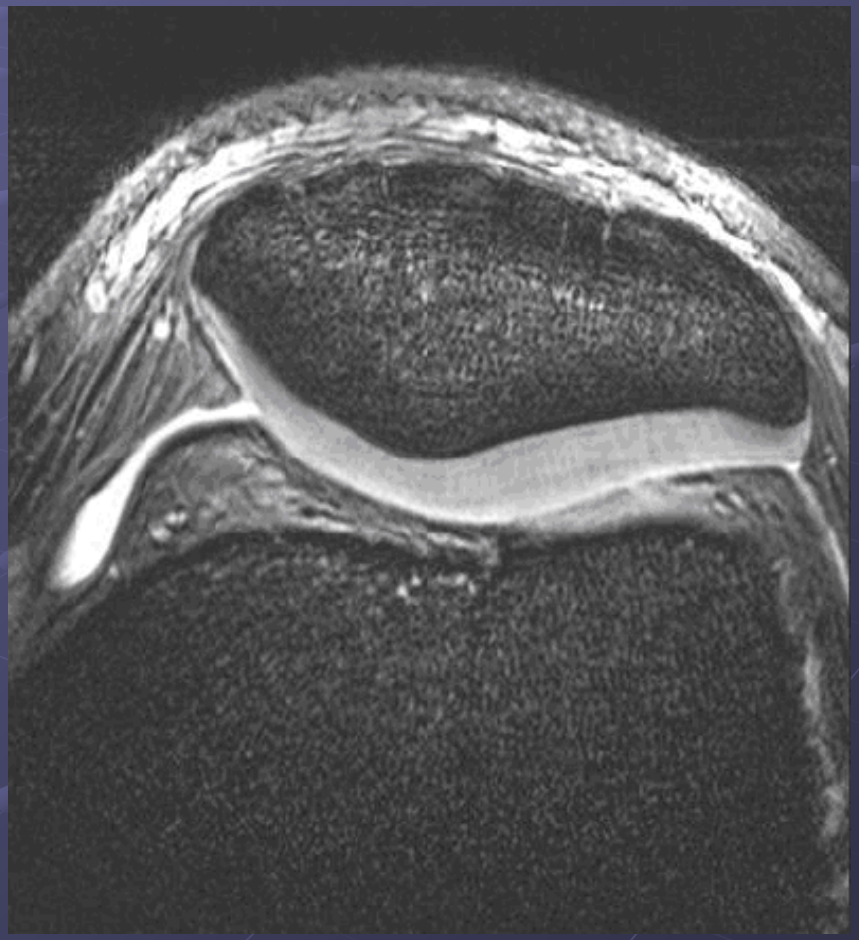
Femur

- Head and fovea capitus
  - Articulate with pelvis
- Neck (“fx pelvis”)
- Greater and Lesser Trochanters
- Shaft
- Lateral and medial condyles and epicondyles
- Intercondylar fossa
- Patellar Surface



Patella = knee cap

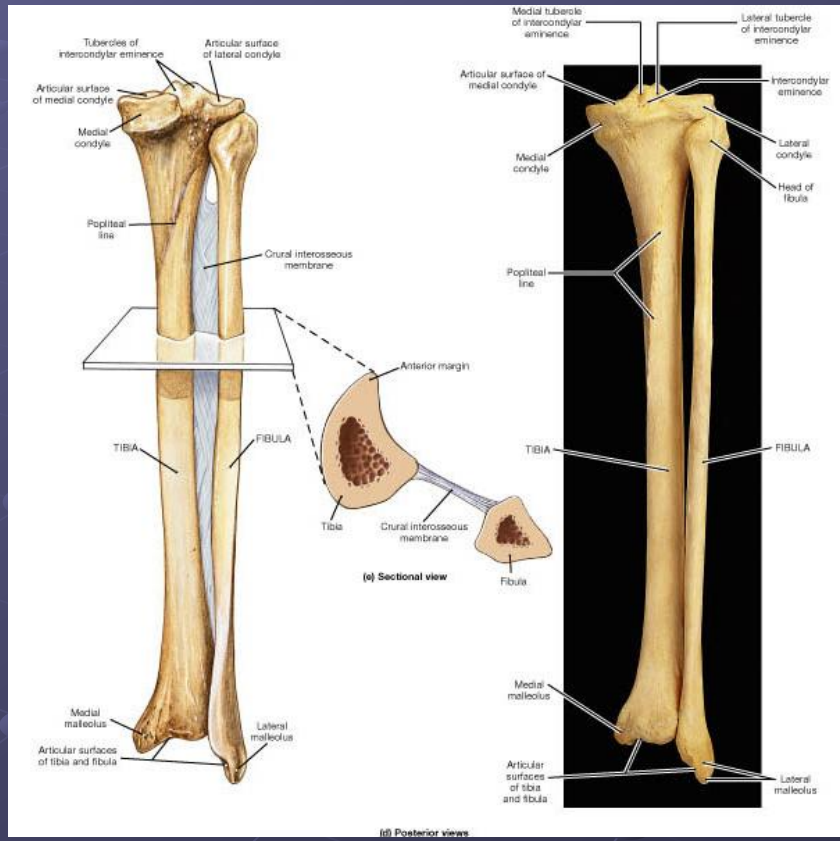
- Sesamoid Bone
- Enclosed in the tendon of the quadriceps group of muscles



“Skyline” MRI of patella

Tibia = shin bone

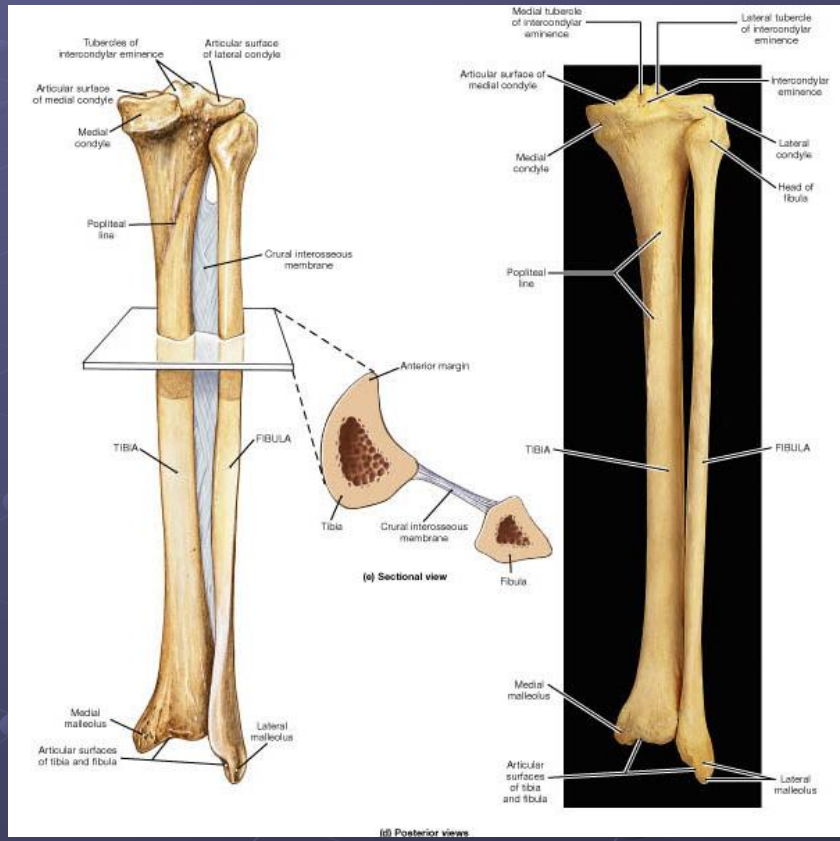
- Lateral and medial condyles
  - Intercondylar eminence
- Tibial tuberosity
- Inferior articular surface
- Medial malleolus
  - (= ankle bone)



Interosseous Membrane

Fibula

- Head
- Shaft
- Lateral malleolus
  - (= ankle bone)
- Not weight bearing
  - Frequent fx

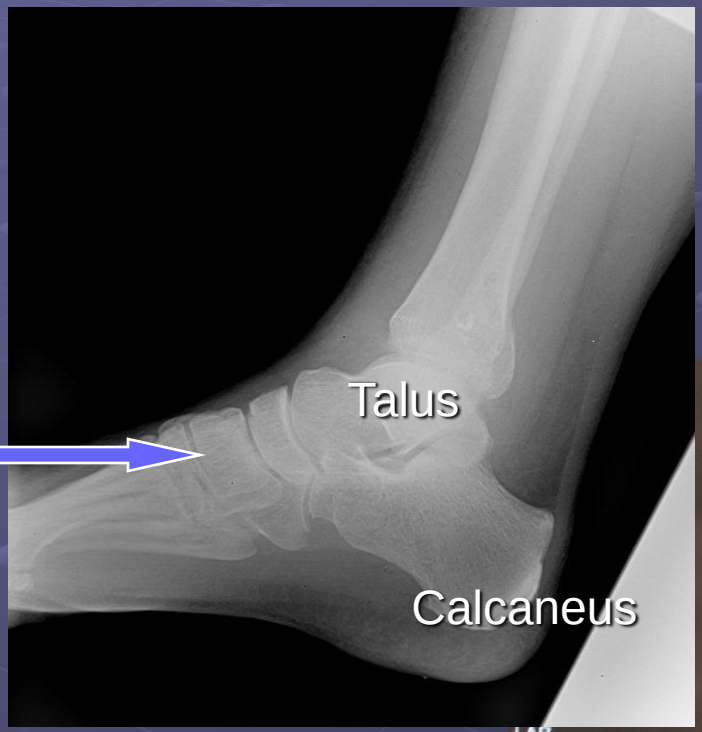


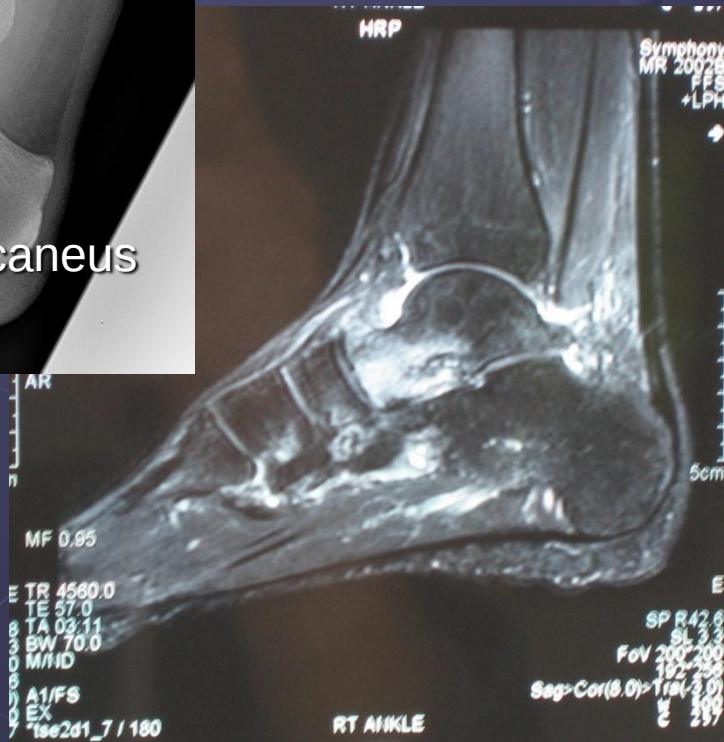
Interosseous Membrane

Tarsus (7 bones)

Cute Tillie Never Could Cooperate

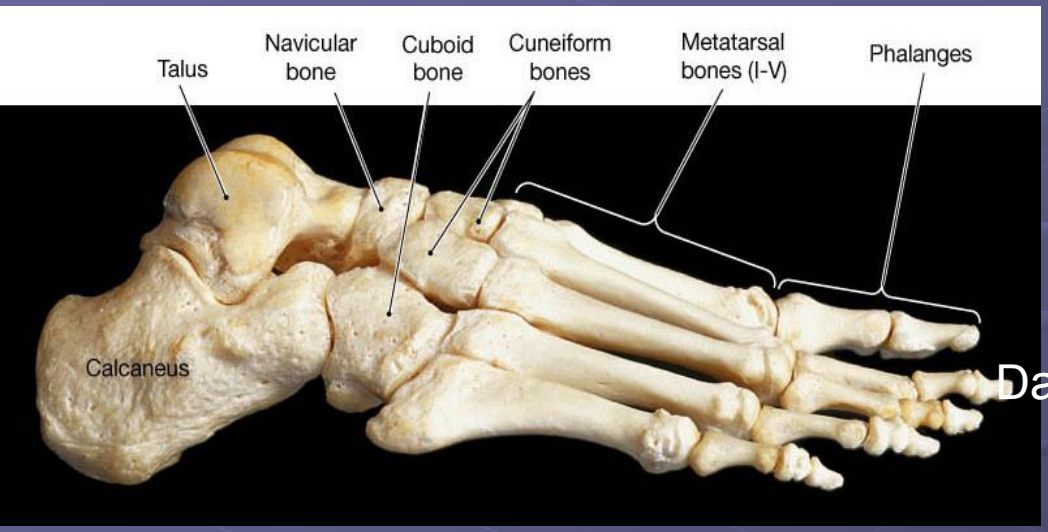
Navicular
Cuboid
Cunieform (3)





Foot

Cute Tillie Never Could Cooperate



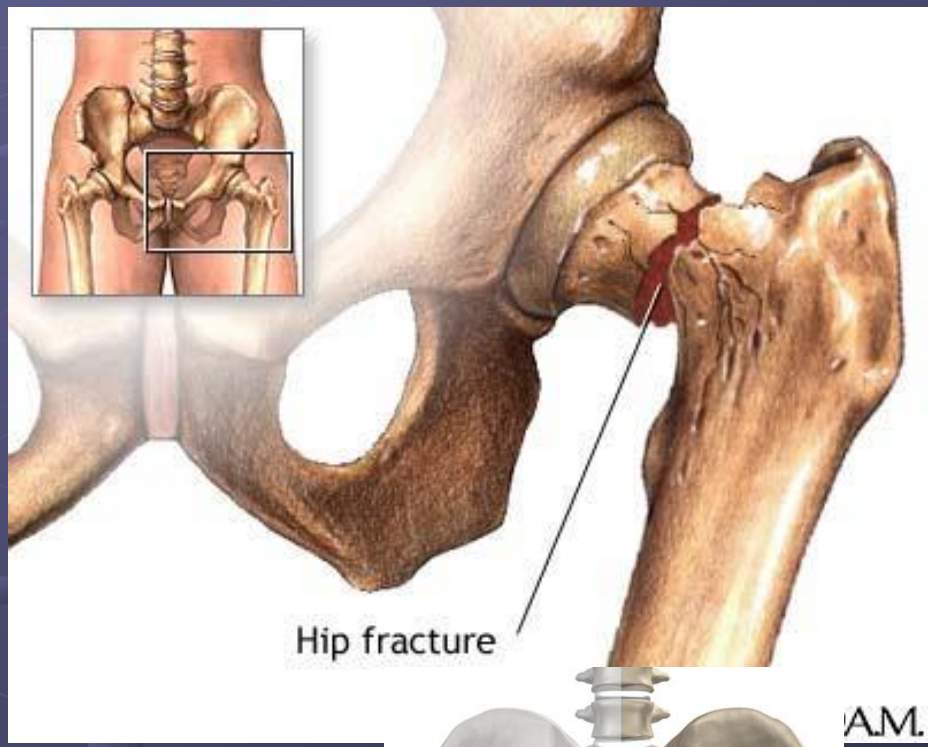
- Metatarsals (1-5)
- Phalanges (3 per toe except big toe)
- Longitudinal Arches
  - Medial and lateral
- Transverse Arch

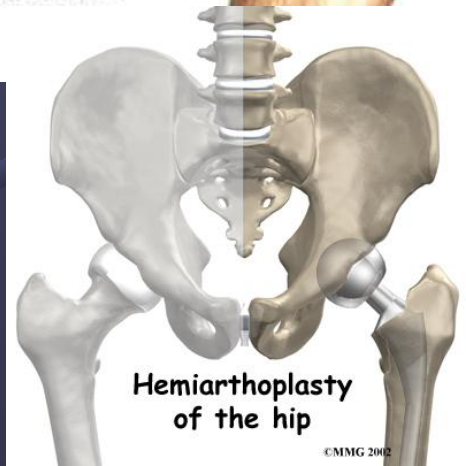
Fractures (a review)

- Bleeding
  - Then clot
- Periosteal reaction
  - Fibroblasts
  - Osteoblasts
- Callus
  - New bone “collar”
- Remodeling

“Hip” fracture

- “Grandma fell and broke her hip.”
  - More accurately, “Grandma broke her femoral neck and then fell.”
  - Sometimes the fx is at the intertrochanteric line
- Diabetes, hypertension, osteoporosis
- 25% die from complications in first year mostly related to immobility:
  - Anesthesia
  - Muscle Atrophy
  - Pneumonia
  - Decubitus ulcers
  - Depression and disorientation





Douglas Iris